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(54) Abstract Title

Automatically setting a receiver display mode for an electronic programme guide (EPG).

(57) The mode for displaying a received electronic programme guide (EPG) is automatically set by parsing or analysing a datastream (Step 20) containing programme guide information. The type of programme guide present is then determined (Step 22) and the display mode is set accordingly (Steps 24a or 24b). As shown, a schedule parser determines the whether the EPG is a 'schedule' EPG (Figure 1A) or a 'present/following' type EPG (Figure 1B), depending on the value (1 or 0) of a schedule flag contained in the bitstream. The method removes the need for the user to manually set the EPG mode, and automatically adjusts the display mode should the television service provider change EPG broadcast mode.

FIG. 2

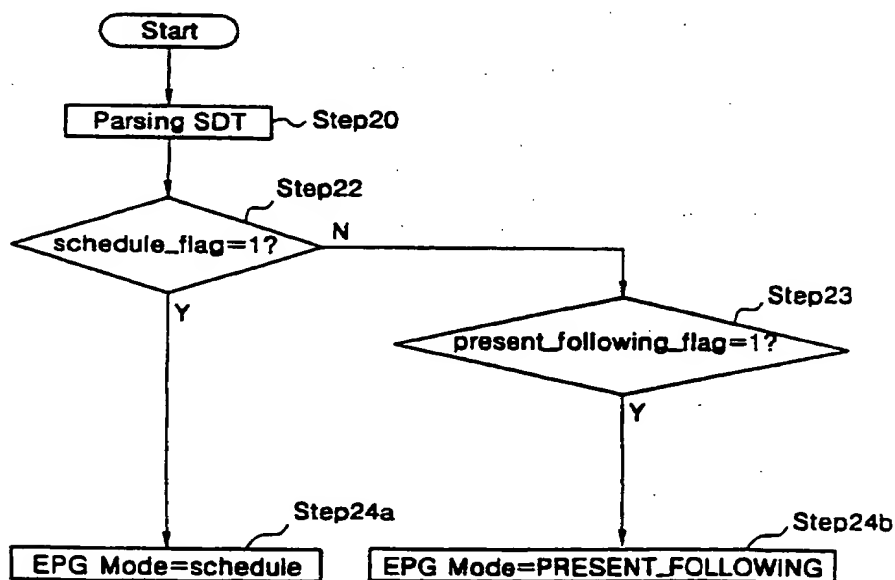


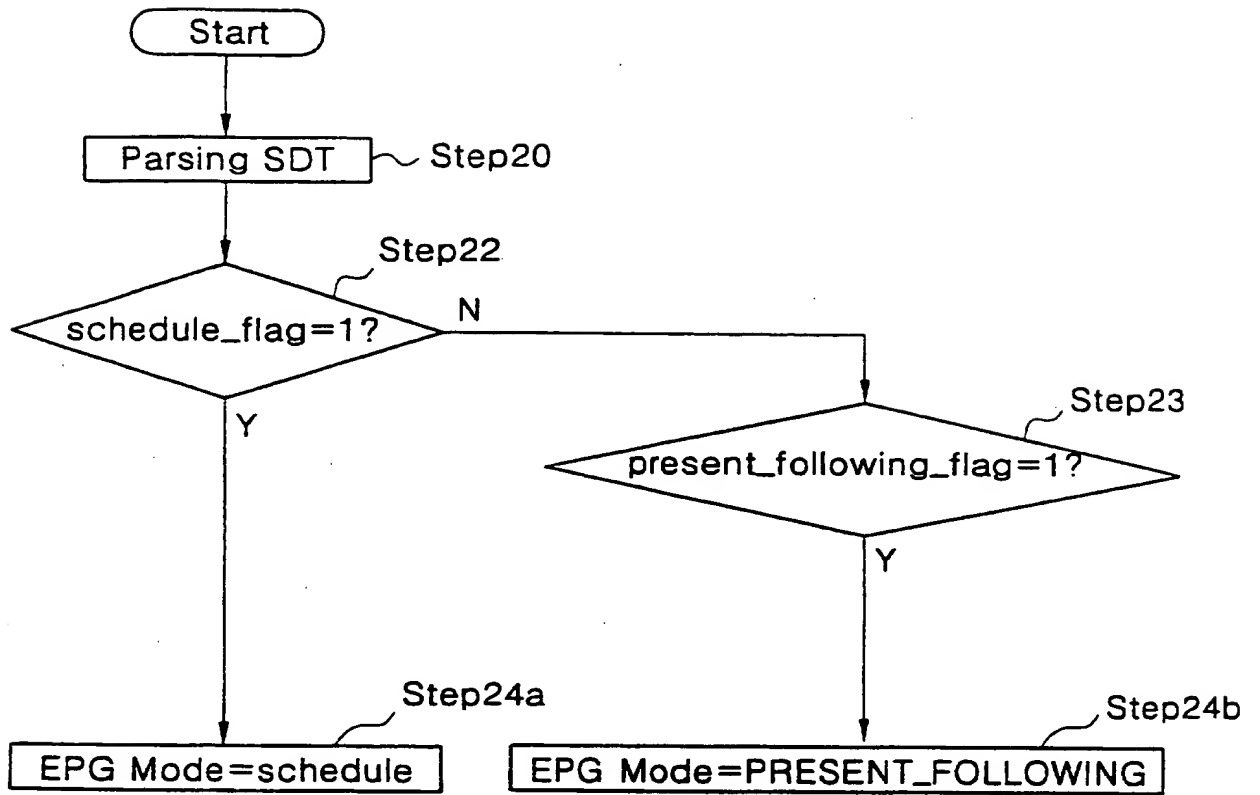
FIG. 1A

Ch1	Title1	Title2	
Ch2	Title3	Title4	Title5
Ch3	Title6	Title7	
Ch4	Title8		Title9
Ch5	Title11	Title12	Title13
2:00 : 3:00 :			

FIG. 1B

	Present	Following
Ch1	Title1	Title2
Ch2	Title3	Title4
Ch3	Title5	Title6
Ch4	Title7	Title8
Ch5	Title9	Title10

FIG. 2



METHOD FOR AUTOMATICALLY SETTING A DISPLAY MODE
CORRESPONDING TO A PROGRAMME GUIDE TYPE

5 The present invention relates to a method for
automatically setting a display mode in correspondence to
a currently provided programme guide type in a digital TV
receiver, and more particularly, to a method for
automatically setting a display mode in correspondence to
10 whether a provided electronic programme guide (EPG) type
is a schedule EPG type or a present/following EPG type.

A digital broadcasting system which is being currently
standardized multiplexes at least one broadcast programme
15 into a bitstream, based on the MPEG-2 standard transport
stream (TS). Also, the digital broadcasting system
transmits the multiplexed bitstream to a receiver using a
ground wave broadcasting medium, a satellite broadcasting
medium, a cable broadcasting medium or a medium
20 incorporating the preceding media. A digital broadcasting
receiver demultiplexes the bitstream received from a
transmitter and separates and reproduces a particular
programme to be viewed. The digital broadcasting system
transmits a bitstream to which programme guide information
25 about channels and times of programmes to be broadcast is
added, to thereby enable users to easily select a
programme to be broadcast via a particular channel among a
plurality of channels.

30 In general programme guide information provided in a
digital broadcasting system is called an EPG. EPG's are
largely divided into a schedule type EPG (or a full EPG)
and a present/following type EPG (or a now/next EPG). The

schedule type EPG provides programme guide information by channels and times for a certain period of time, e. g., seven or fourteen days, which is chiefly adopted in a DTV system in the U. S. A., the Republic of Korea, etc.,. The present/following type EPG provides only present and next programme guide information by each channel, which is chiefly adopted in a DT-TV system in Europe, etc. Display modes respectively corresponding to the schedule EPG and the present/following EPG will be described with reference to Figures 1A and 1B. Referring to Figure 1A in the case of a display mode corresponding to the schedule type EPG, the transmitted schedule EPG information is displayed on a screen in which the schedule EPG information is contained in a graphic chart whose vertical axis is sectioned by channels and whose horizontal axis is sectioned by times in proportion to the length of a broadcasting time of each programme. Referring to Figure 1B, in the case of a display mode corresponding to the present/following EPG, the transmitted present/following EPG information is displayed on a screen in which the present/following EPG information is contained in a graphic chart whose vertical axis is sectioned by channels and whose horizontal axis is sectioned into present programme title areas and following programme title areas.

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Conventional type digital broadcasting receivers set the EPG display mode of a corresponding system into one of the above-described EPG display modes, in advance. Also, the digital broadcasting receiver displays the programme guide information extracted from the received bitstream on the screen as a predetermined EPG display mode. Thus, when an EPG type provided from a transmitter and a predetermined EPG display mode in the broadcasting

receiver are different from each other, the programme guide information cannot be displayed on the screen or configuration of the picture is transformed. In more detail, if a digital broadcasting receiver which has been set as the present/following EPG display mode in advance receives programme guide information of the schedule EPG type, the received information cannot be displayed on the screen. Conversely, if a digital broadcasting receiver which has been set as the schedule EPG display mode in advance receives programme guide information of the present/following EPG type, the configuration of the graphic chart to be displayed on the screen goes wrong.

With a view to solve or reduce the above problems, the digital broadcasting receiver supports the above two EPG display modes and at the same time adopts a menu setting method via a user interface. In this case, the user should manipulate a menu and check which type(s) of EPG are provided as needed, which causes a considerable inconvenience in use. Also, if a respectively different EPG type is provided by channels or times in the same region, a user cannot see easily which type of the EPG is currently provided, which causes a confusion in use. As an example, since the BBC have decided to adopt a seven-day schedule EPG recently, there may co-exist a schedule EPG type and a present/following EPG type. As such, in the case that a broadcasting service provider changes the EPG type, the digital broadcasting receiver adopting the above-described types cannot set a display mode automatically for adaption to the changed EPG type.

With a view to solve or reduce the problems above, it is an aim of embodiments of the present invention to

provide a method for automatically setting a display mode corresponding to a programme guide type provided from a broadcasting channel which is being currently received in a digital broadcasting receiver.

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According to a first aspect of the invention, there is provided a method for automatically setting a display mode corresponding to a provided programme guide type in a digital broadcasting receiver, the automatic display mode setting method comprising: (a) parsing a bitstream containing at least one programme and discriminating a programme guide type of the programme guide information contained in the bitstream; and (b) setting a display mode corresponding to the discriminated programme guide type as a display mode of the received programme guide information.

Preferably, said step (a) parses a table included in the bitstream and containing service information provided from a transmitter, and discriminates a providing type of the programme guide information.

said table containing the service information is preferably a service description table.

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Said programme guide type may be divided into a first type for providing programme guide information by channels and times for a certain period of time with respect to programmes and contained in said bitstream, and a second type for providing present programme guide information and next programme guide information by each channel with respect to the programmes.

Preferably, said display mode corresponding to the first type is a type for displaying a graphic chart whose vertical axis is sectioned by channels and whose horizontal axis is sectioned by times in proportion to a
5 broadcasting time length of each programme on the screen, and wherein said display mode corresponding to the second type is a mode for displaying a graphic chart whose vertical axis is sectioned by channels and whose horizontal axis is sectioned into two areas on the screen.

10

Said first type may be a schedule EPG type and said second type a present/following EPG type.

For a better understanding of the invention, and to
15 show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings in which:

Figure 1A shows a graphic chart configured in
20 correspondence to a screen appearance of a schedule type EPG on a screen;

Figure 1B shows a graphic chart configured in
correspondence to a screen appearance of a
25 present/following type EPG; and

Figure 2 is a flowchart view for explaining an automatic display mode setting method in correspondence to a provided programme guide type according to a preferred
30 embodiment of the present invention.

A variety of digital standards are being currently standardized according to countries and transmission

media. Most digital broadcasting standards relate to transmission standards for digital broadcasting which adopt an MPEG-2 transport stream (TS) standard. Since the detailed description of the MPEG-2 TS standard is known to one skilled in the art, only the portions directly relating to aspects of the present invention will be described briefly below. The MPEG-2 TS standard provides programme specification information (PSI) for demultiplexing a plurality of programmes multiplexed into one bitstream. The PSI includes at least two tables, that is, a programme association table (PAT) and a programme map table (PMT). The PAT enables an identification of a PMT corresponding to each programme contained in a multiplexed bitstream. The PMT enables an identification of a TS packet corresponding to each basic stream, e. g. a video stream, an audio stream or a data stream, for each programme. The PAT and PMT contain programme specification information which is necessarily required for selecting a particular programme among a plurality of programmes contained in a received bitstream, respectively.

In addition to the tables for the above-described programme specification information, the bitstream of the digital broadcasting system can further include tables containing various service information (SI) provided by a broadcasting service provider. If the above-described PAT and PMT are checked, packet identifiers (PID) of packets containing the service information tables are checked. As an example, the service information tables are a service description table (SDT), and an event information table (EIT) containing programme guide information designated by the service description table and according to channels

and times of the programmes. Thus, the digital broadcasting receiver parses the PAT, PMT, SDT, and EIT among the received bitstream and extracts the programme guide information transmitted from the transmitter.

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Referring to Figure 2 which shows a preferred embodiment of the present invention, a method for discriminating a programme guide type provided by a broadcasting service provider and automatically setting a display mode in correspondence to the discriminated programme guide type in a digital broadcasting receiver, will be described. The flow-chart of Figure 2 explains that for the case of the programme guide information being transmitted as an EPG, data enabling an identification of a programme guide type is contained in a SDT, and the programme guide information is contained in an EIT.

Referring to Figure 2, a stream parser (not shown) in a digital broadcasting receiver parses a PAT and a PMT contained in a received bitstream to find a SDT, and parses the found SDT (step 20). The SDT contains identification data which enables an identification of a currently provided EPG type. For example, in the case that identification data is comprised of a flag bit identifying a schedule EPG and a present/following EPO provided by a broadcasting service provider, the identification data enables an identification of which one is the currently provided EPG type among the two EPO types. The stream parser first checks whether a schedule-flag bit configuring identification data is "1" (step 22). If the schedule-flag bit is "1" in step 22, the currently provided EPG type is a schedule EPG. Accordingly, a controller (not shown) sets a display mode of the

programme guide information as a schedule EPG display mode (step 24a).

Meanwhile, if the schedule-flag bit is "0" in the
5 checked result of the step 22, the currently provided EPG
type is not a schedule type EPG. Accordingly, it is
checked whether a present following-flag bit configuring
identification data is "1" (step 23). If the present
following-flag bit is "1" in the result of the checking of
10 step 23, the currently provided EPG type is a
present_following type EPG. Accordingly, the controller
(not shown) sets a display mode in the programme guide
information as a present-following EPG display mode (step
24b). Therefore, a display mode corresponding to a
15 currently served EPG type is automatically set in a
digital broadcasting receiver.

The stream parser (not shown) extracts programme guide
information such as a schedule EPG or present_following
20 EPG contained in the EIT, and supplies the extracted
result to the controller. In the case that a display mode
is set as a schedule EPG display mode in step 24a, the
controller restores the schedule EPG data supplied from
the stream parser into the state kept before being
25 compressed, and contains the restored data in the graphic
chart shown in Figure 1A, so as to control the graphic
chart to be displayed on the screen. In the case that a
display mode is set as a present/following EPG display
mode in step 24b, the controller restores the
30 present/following EPG data supplied from the stream parser
into the state kept before being compressed, and contains
the restored data in the graphic chart shown in Fig 1B, so
as to control the graphic chart to be displayed on the

screen.

Thus, broadcasting receivers according to embodiments of the present invention can display the received programme guide information in a corresponding display mode on the screen automatically. Accordingly, the user need not check which type of programme guide information is currently provided, thereby remarkably increasing convenience in use. Also, even if a broadcasting service provider changes a programme guide information providing type, the present invention enables a digital broadcasting receiver to adaptively countermeasure thereto.

The present invention has been described with respect to the preferred embodiment. It is apparent to one skilled in the art that there may various variations and modifications without departing from the technical scope of the appended claims.

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, 5 each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the 10 foregoing embodiment(s). The invention extend to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so 15 disclosed.

CLAIMS

1. A method for automatically setting a display mode
corresponding to a provided programme guide type in a
5 digital broadcasting receiver, the automatic display mode
setting method comprising:

(a) parsing a bitstream containing at least one
programme and discriminating a programme guide type of the
10 programme guide information contained in the bitstream;
and

(b) setting a display mode corresponding to the
discriminated programme guide type as a display mode of
15 the received programme guide information.

2. The automatic display mode setting method of claim 1,
wherein said step (a) parses a table included in the
bitstream and containing service information provided from
20 a transmitter, and discriminates a providing type of the
programme guide information.

3. The automatic display mode setting method of claim 2,
wherein said table containing the service information is a
25 service description table.

4. The automatic display mode setting method of claim 1,
2 or 3, wherein said programme guide type is divided into
a first type for providing programme guide information by
30 channels and times for a certain period of time with
respect to programmes and contained in said bitstream, and
a second type for providing present programme guide
information and next programme guide information by each

channel with respect to the programmes.

5. The automatic display mode setting method of claim 4 wherein said display mode corresponding to the first type
5 is a type for displaying a graphic chart whose vertical axis is sectioned by channels and whose horizontal axis is sectioned by times in proportion to a broadcasting time length of each programme on the screen, and

10 wherein said display mode corresponding to the second type is a mode for displaying a graphic chart whose vertical axis is sectioned by channels and whose horizontal axis is sectioned into two areas on the screen.

15 6. The automatic display mode setting method of claim 4 or 5, wherein said first type is a schedule EPG type and said second type is a present/following EPG type.

7. An automatic display mode setting method substantially
20 as herein described with reference to Figure 2.



Application No: GB 9917673.7
Claims searched: 1-7

Examiner: Matthew Males
Date of search: 28 January 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.R): H4F (FBB)

Int CI (Ed.7): H04N 5/445, 7/025, 7/08, 7/087, 7/088, 7/173

Other: ONLINE: WPI, EPODOC, PAJ.

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	EP 0,701,367 A1 (Thompson), whole document but see column 2, lines 18-47.	-
A	US 5,793,438 (Bedard), whole document but see Figure 3C and column 3, line 23-column 4, line 3.	-
A	US 5,737,030 (Hong et al), whole document but see column 3, lines 17-35.	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

FIG. 1A

Ch1	Title1	Title2	
Ch2	Title3	Title4	Title5
Ch3	Title6	Title7	
Ch4	Title8		Title9
Ch5	Title11	Title12	Title13
2:00 : 3:00 :			

FIG. 1B

	Present	Following
Ch1	Title1	Title2
Ch2	Title3	Title4
Ch3	Title5	Title6
Ch4	Title7	Title8
Ch5	Title9	Title10

FIG. 2

